

REMARKS

The error in the serial number on page one (1) of the specification has been amended as per the Examiner's request. Applicants thank the Examiner for pointing out this error.

An error in Fig. 20 is been corrected in the new Fig. 20 submitted with this amendment. In block 264 near the upper left of the figure, the word --is-- has been changed to --in--.

The omission of block 264 in the original description of Fig. 20 is hereby corrected in the amendment to the specification on page 20.

Claims 45, 47–50 were rejected under 35 U.S.C. 102(b) as being anticipated by Gerner (U.S. Patent 5,230,475). This rejection is respectfully traversed.

Amended claim 45 now clarifies what applicants meant by “monitoring.” Specifically, there are three steps to what was originally claimed as “monitoring:”

- monitoring the condition of a machine at a first time;
- monitoring the condition of the machine at a second time later than the first time;
- comparing the condition at the first time to the condition at the second time.

Although Gerner discloses the use of a speed sensor 119 (see Fig. 6), Gerner does not disclose a method including comparing information from the brush chipper at different times.

The amendments in claim 45 are supported in Fig. 20 block 264 and in the description of Fig. 20 in the specification.

The calculation of acceleration (deceleration being a negative acceleration) is well known in the art. Specifically, sophomore engineering physics texts¹ define acceleration as the first temporal derivative of velocity. In this case, the velocity and acceleration are *angular* velocity, ω and *angular* acceleration, α , because we are speaking of the deceleration of the engine shaft (for instance). Mathematically, this is represented as:

¹ See, for instance, F. J. Bueche. 1980. *Introduction to Physics for Scientists and Engineers*. 3rd ed. McGraw-Hill Book Co. New York, NY. Page 166 eq. 9.2.

$$\alpha = \frac{d\omega}{dt}$$

where t represents time.

In freshman calculus text books,² a derivative is defined as:

$$\frac{dy}{dx} = \lim_{\Delta x \rightarrow 0} \frac{y(x + \Delta x) - y(x)}{\Delta x}$$

Again, from calculus text books,² the Taylor Series is defined as:

$$y(x + \Delta x) = y(x) + \left. \frac{dy}{dx} \right|_x (\Delta x) + \frac{1}{2!} \left. \frac{d^2 y}{dx^2} \right|_x (\Delta x)^2 + \frac{1}{3!} \left. \frac{d^3 y}{dx^3} \right|_x (\Delta x)^3 + \dots$$

Where the derivatives of all orders are evaluated at x as indicated. The usual approach to obtain a first order approximation to the first derivative at x , found in introductory level numerical partial differential equation (finite difference) texts,³ is to ignore terms containing derivatives greater than the first derivative, and rearrange. The result is:⁴

$$\frac{dy}{dx} \cong \frac{y(x + \Delta x) - y(x)}{\Delta x}$$

Therefore an approximation of angular acceleration, α , given values of angular velocity, ω , at two different times, where the duration of time between the two different times is Δt , may be calculated as:

$$\alpha = \frac{d\omega}{dt} \cong \frac{\omega(t + \Delta t) - \omega(t)}{\Delta t}$$

which shows that the calculation of the rate of engine deceleration, as disclosed in block 264 of Fig. 20, requires each of the steps included in the amendments of claim 45:

- monitoring the angular velocity, ω , at a first time, t ;
- monitoring the angular velocity, ω , at a second time, $t + \Delta t$; and

² See, for instance, E.W. Swokowski. 1979. *Calculus with Analytic Geometry*. 2nd ed. Prindle, Weber & Schmidt, Boston, MA.

Or, see <http://www.me.berkeley.edu/~e77/lecnotes/ch16/ch16.htm>

³ See, for instance L. Lapidus and G.F. Pinder. 1982. *Numerical Solution of Partial Differential Equations in Science and Engineering*. John Wiley & Sons. New York, NY.

⁴ See, for instance, <http://www.me.berkeley.edu/~e77/lecnotes/ch16/ch16.htm>

- comparing the monitored values at the two times to calculate an acceleration (deceleration).

Copies of pages from the above mentioned books are included with this amendment for reference.

Regarding claim 49, Gerner does not disclose “monitoring a time sequence of the condition of a hydraulic switch for sensing a predetermined high pressure in the hydraulic control,” and “if the said time sequence indicates the hydraulic switch senses said predetermined high pressure for a predetermined time duration, momentarily reversing the feed rollers for a predetermined period of time.”

Instead, Gerner discloses, “The relief valves 114, 116 will release the hydraulic pressure if such pressure builds beyond a designated level between main shuttle valve 92 and the hydraulic motors 62, 64.” (Col. 5 lines 30–34.) Releasing the hydraulic pressure will not reverse the feed rollers.

Claims 47–50 depend on claim 45. Because amended claim 45 is now clearly allowable, these dependent claims are also presumed allowable.

Claims 55–57 were rejected under 35 U.S.C. 103(a) as being unpatentable over Gerner. This rejection is respectfully traversed.

Regarding claim 55 which recites calculation of a deceleration rate, Gerner provides no teaching on calculating any value based on any monitored information. Further, no mention is made of deceleration or even acceleration. Gerner does not suggest any structure with which to use such a calculation. It is therefore not obvious from Gerner to calculate the rate of deceleration of the rotation of the engine for the purpose of modifying the performance thereof.

Further, claims 55–57 depend on claim 45. Because amended claim 45 is now clearly allowable, these dependent claims are also presumed allowable.

Claim 58 is currently new and is added to help clearly define the invention.

Accordingly, because all remaining claims 45-58 are believed to be clearly allowable, a notice to that effect is earnestly solicited.

Respectfully submitted,

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